**How to Write a Formal Lab Report**

This guide provides instructions and example of writing a *formal* lab report for any science class. While you are accustomed to routine lab reports written in a notebook or journal, a formal lab report differs in a few ways.

**Tips for Success:**

* A formal report is typed. This ensures that the data is readable. Most handwriting is not legible enough to be used on a formal report. Thus, typing the report is a requirement.
* **Be Concise**. In scientific writing, it is important to say as much as you can in as few words as possible. Proper grammar and sentence structure must be followed, but the elimination of wordy statements or unnecessary information is a must.
* **Write in Third Person.** You can not use the words “I” or We” when referring to the experimental procedure or data. For example, instead of “I boiled the water for 5 minutes,” you should say “The water was boiled for 5 minutes.” This is difficult, so you must be careful of this as you are writing.
* **Use Correct Verb Tense.** The general rule is: In the procedure section, use past tense; in the hypothesis, use future tense; and in the data, materials, and conclusion, use present tense.
* **Take good notes during the experiment.** It is important to write down any and all observations during an experiment. This includes materials used, actions taken, and results presented.
* **Write about what really happened.** Do not write about what “should” have happened. The bulk of your grades will come from your conclusion statements. This is where you prove what you learned.

**Format:**

1. **Title Page**
   1. Name of the Experiment
   2. Your name
   3. Your partners’ names
   4. Date on which the experiment concluded
2. **Abstract Page**
   1. An abstract is a short summary of the report. It should not be any more than 1 paragraph (100-200 words) and include 1-2 sentences on each of the following topics
      1. Purpose of the experiment
      2. Key results
      3. Major points of data collected
      4. Main Conclusion idea
3. **Introduction**
   1. **Paragraph One:** Purpose of the Lab, Experimental Question
      1. Should be 1-2 sentences as maximum
   2. **Paragraph Two:**  Hypothesis and background information used to formulate the hypothesis
      1. 5-7 Sentences maximum
4. **Materials and Methods**
   1. A bulleted list of all materials used throughout the experiment
   2. Sketch of experimental apparatus
5. **Experimental Procedure**
   1. A paragraph formatted explanation of the steps in the experiment, should be written such that a person who was not present could conduct the experiment upon reading this statement.
6. **Results**
   1. **Raw Data:** Written in a table format. The table must be titled, and have units in heading when appropriate. Each table must be referenced in the conclusion statement.
   2. **Important Results:**  Written in paragraph form. For main ideas that will be used in the conclusion section, write in full sentences with key facts typed in *italics*.
   3. **Calculations:** All calculations should be in both a mathematical format and in a written format. All data calculations that will be referenced in the conclusion should be typed in **bold** text.
7. **Conclusions**
   1. **Compare the actual results with the expected results.** In other words, accept or reject your hypothesis and explain why you have chosen to do that.
   2. **Analyze experimental error.** There is a degree of error in every experiment, thus every lab report should include sources of error. Be sure to not only mention the error, but also the source of the error. For example “… measurement of force was 0.9N different than the accepted value due to the spring scale malfunctioning.”
   3. **Explain how the methods could be improved.** Once you have classified the error in the experiment, explain how the error might have been avoided.
   4. **Explain the results in terms of the purpose of the experiment.** If the purpose of the lab was achieved, discuss how you were successful. Site data from your data section here. If your results disprove your initial thoughts, site data to prove that as well.
   5. **Relate the data to results of other similar experiments.** Depending on the nature of the experiment, you may want to compare your results to that of other people in the class or other experiments. If your results are similar to other data, then your results have a chance of being accurate, if not, then explain why.
8. **Appendices**
   1. An appendix is an additional page or pages that make the lab report look better organized. For example, if you have a lot of calculations that would be quite difficult to type into a computer, you may reference this section in the data section of the report. This is also the section in which you will place any graphs that are associated with the data.